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INTRODUCTION.

This REVIEW is based on reports for November, 1890, from 2,314 regular and voluntary observers. These reports are classified as follows: 163 reports from Signal Service stations; 118 reports from United States Army post surgeons; 1,462 monthly reports from state weather service and voluntary observers; 31 reports from Canadian stations; 188 reports through the Central Pacific Railway Company; 347 marine reports through the co-operation of the Hydrographic Office, Navy Department; marine reports through the "New York Herald Weather

Service;" monthly reports from the local weather services of Alabama, Arkansas, Colorado, Illinois, Indiana, Iowa, Weather and Crop Service, Kansas, Kentucky, Louisiana, Michigan, Minnesota, Missouri, Nebraska, Nevada, New England, New Jersey, New York, North Carolina, North and South Dakota, Ohio, Oregon, Pennsylvania, Tennessee, Texas, and Wisconsin, and international simultaneous observations. Trustworthy newspaper extracts and special reports have also been used.

CHARACTERISTICS OF THE WEATHER FOR NOVEMBER, 1890.

The month was the driest November on record at stations on the south New England coast, in the middle and south Atlantic and east Gulf states, in the upper Missouri valley, in the middle and northern plateau regions, and along the Pacific coast. At Fort Stanton, N. Mex., and Fort Apache, Ariz., the precipitation was the heaviest ever reported for November. At stations on the middle Pacific coast having long records no precipitation was reported, while the average precipitation for November in that district is 2.83. In the northern plateau region about 2 per cent. of the average precipitation for November was reported. In the middle and south Atlantic and east Gulf states, and in the middle plateau region one-tenth to two-tenths, in New England, the Rio Grande Valley, the extreme northwest, and the north and south Pacific coasts one-fourth to one-half, and in the Ohio Valley and Tennessee, the upper Mississippi valley, the upper lake region, the northeast slope of the Rocky Mountains, and the west Gulf states two-thirds to three-fourths of the usual amount of precipitation for November was reported. At Key West, Fla., and on the southeast slope of the Rocky Mountains the monthly precipitation was about double the average, and in the southern plateau and the Missouri Valley it was about one-tenth greater than the average for November. In the lower lake region the precipitation was about normal. The greatest depth of snowfall reported was 27 inches, at Cumbres, Colo. The monthly snowfall exceeded 15 inches in central Colorado, and was more than 10 inches in extreme north upper Michigan, southwest Nebraska, central New York, and west-central South Dakota. Trace of snow fell north of a line traced from south New Jersey irregularly west-southwest to north-central Tennessee, thence irregularly northward to east Iowa, thence southwestward to southeast Arizona, thence northwestward over east California to north-central California, and thence northeastward to north Idaho.

The month was the warmest November in the history of the Signal Service at stations in the Atlantic coast states from Virginia to north Florida, in the east Gulf states, the Ohio Valley and Tennessee, the upper Mississippi, Missouri, and Red River of the North valleys, and along the middle and

south Pacific coasts. During a warm spell which prevailed in Minnesota, Iowa, Nebraska, and the Dakotas from the 15th to 26th the temperature was 15° to 26° above the normal for the latter half of November, and it was the warmest period on record for the season in that region during the last sixteen years. The highest temperature reported by a regular station of the Signal Service was 96°, at Los Angeles, Cal., and by a voluntary observer, 102°, at Pomona, Cal. The lowest temperature reported by a regular station of the Signal Service was -2°, at Saint Vincent, Minn., and by a voluntary observer, -20°, at Breckenridge, Colo. Killing frost occurred as far south as Mobile, Ala., on the 4th, where it was about two weeks earlier than usual, and at Portland, Oregon, on the 6th, where it was about one week later than usual.

A tornado was reported near Erie, Pa., on the 17th, and a heavy hail storm in the Wyoming Valley, Pa., on the 19th. Heavy wind storms occurred over Lakes Ontario, Huron, and Superior on the 2d; on Lake Michigan on the 3d; on Lakes Huron and Michigan on the 5th; on Lake Michigan on the 6th; at Fort Bowie, Ariz., on the 7th; on Lake Erie and at Healdton, Ind. T., on the 9th; at Fayette, Miss., on the 15th; and in Louisiana on the 16th. A high "norther" prevailed in California on the 11th and 12th, and severe gales occurred over south and east Florida on the 29th. A heavy gale, attended with squalls of almost hurricane force and unusually high seas, caused considerable damage to shipping interests in Newfoundland on the 29th. Floating ice was reported in the Mississippi River at Saint Paul, Minn., on the 9th, and thin ice covered the river at Red Wing, Minn., on the 10th. From the 9th to 14th floating ice was reported in the Missouri River at Fort Buford, N. Dak.; on the 8th anchor ice was observed at Scranton, S. Dak.; on the 10th ice was running in the river at Fort Sully, S. Dak., and on the 11th navigation closed at that point. Ice interrupted navigation on the Erie Canal in east-central New York on the 27th and 28th. Floods and high water in the rivers were reported in west Arizona on the 8th. On the 7th auroras were noted in the Atlantic coast states from New Hampshire to Maryland, and in Wisconsin, Minnesota, Iowa, Nebraska, the Dakotas, and Montana.